Curriculum Vitae Silvia Jiménez Bolaños December 22, 2016

Contact

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Research Areas

Nonlinear partial differential equations, Homogenization theory, Mathematical material sciences, Multiscale analysis.

Professional Experience

- July 2015 Present Assistant Professor, Colgate University.
- August 2013 July 2015 Visiting Assistant Professor, Colgate University.
- August 2010 July 2013 Visiting Assistant Professor, Worcester Polytechnic Institute.
- Spring 2001- Spring 2004 Instructor, Universidad de Costa Rica, Costa Rica.
- Spring 2002 Spring 2004 Teacher, Panamerican High School, Costa Rica.

Education

Summer 10	PhD., Mathematics, Louisiana State University. PhD. Adviser: Prof. Robert Lipton.
Spring 06	M.S., Mathematics, Louisiana State University.
Spring 02	B.S., Mathematics, Universidad de Costa Rica.

Publications

- S. Jiménez and B. Vernescu. Nonlinear Neutral Inclusions: Assemblages of Confocal Ellipsoids. R. Soc. open sci., 2015.
- S. Jiménez, B. Vernescu, and W. Sanguinet. Nonlinear Neutral Inclusions: Assemblages of Spheres. IJSS: International Journal of Solids and Structures, 50, 2231-2238, 2013.
- S. Jiménez. Correctors and field fluctuations for the $p_{\epsilon}(x)$ -Laplacian with rough exponents: The Sublinear Growth Case. ESAIM: Mathematical Modelling and Numerical Analysis, 47, 02, 349-375, 2013.
- S. Jiménez and R. Lipton. Correctors and field fluctuations for the $p_{\epsilon}(x)$ -Laplacian with rough exponents. J. Math. Anal. Appl., 2010.

Accepted Article Pending Revisions

• S. Jiménez and B. Vernescu. Navier Slip Length For Viscous Fluids on a Rough Boundary. Submitted to Physics of Fluids.

Articles in Preparation

- B. S. Tilley, S. Jiménez and B. Vernescu. On energy and charge transport in electrokineticallydriven flows through heated porous media.
- S. Jiménez and B. Vernescu. Effective Boundary Condition for the Interface Between a Viscous Fluid and a Porous Medium.

Teaching Experience

Colgate University (An undergraduate university with annual teaching load of 5 courses. All calculus classes meet 4 times a week, the rest meet 3 times a week)

Fall 2016	Math 113 (Calculus I): 1 section Math 308 (Differential Equations): 1 section
Spring 2016	Math 113 (Multivariable Calculus): 1 section - 12 students Math 308 (Differential Equations): 1 section - 25 students
Fall 2015	Math 113 (Multivariable Calculus): 1 section - 21 students Math 111 (Calculus I): 2 sections - 53 students
Spring 2015	Math 112 (Calculus II): 1 section - 13 students Math 311 (Partial Differential Equations): 1 section - 4 students
Fall 2014	Math 113 (Multivariable Calculus): 2 sections - 53 students Math 308 (Differential Equations): 1 section - 12 students
Spring 2014	Math 113 (Multivariable Calculus): 3 sections - 74 students
Fall 2013	Math 113 (Multivariable Calculus): 2 sections - 41 students

Worcester Polytechnic Institute

2012-2013	Math 1024 (Calculus IV): 3 sections: 61 students, 35 students, 35 students Math 501 (Graduate course on Engineering Mathematics): 20 students Math 1023 (Calculus III): 1 section, 72 students
2011-2012	Math 1023 (Calculus III):1 section: 66 students Math 1024 (Calculus IV): 4 sections: 69 students, 58 students, 64 students, 35 students
2010-2011	Math 1023 (Calculus III): 3 sections: 40 students, 30 students, 36 students Math 1024 (Calculus IV): 2 sections: 42 students, 31 students

Louisiana State University

- I was a full instructor for the following classes during my graduate studies: 2 classes of Math 1552 (Analytic Geometry and Calculus II), 2 classes of Math 1550 (Analytic Geometry and Calculus I), 1 class of Math 1021 (College Algebra).
- Moreover, I had the following summer responsibilities:

Coordinator for the MathCircle (Summer 2009): The LSU MathCircle summer enrichment program is a three week summer program at LSU geared primarily toward advanced high school students interested in investigating concepts in mathematics that are not usually introduced at the high school level.

Graduate Assistant for the Math Tune Up (Summers of 2006 and 2009): This course aims at helping first-year graduate students in the sciences and engineerings to obtain mathematical training necessary for pursuing their research interests.

Teaching Awards

Fall 2007	Teaching Excellence Award, Louisiana State University.
Fall 2006	Teaching Excellence Award, Louisiana State University.
Spring 2005	David Oxley Memorial Graduate Student Teaching Award, Louisiana State University.

Professional Development (& Travel support awarded)

May 2016	PIC Math Workshop: (& NSF-Colgate FDC)
	Topic: "Preparing mathematical sciences students for industrial careers by
	engaging them in research problems that come directly from industry."
	Brigham Young University, Provo, Utah.
June 2015	AMS Mathematics Research Communities: (♣ NSF-AMS) Topic: "Differential Equations, Probability and Sea Ice". Snowbird, Utah.

Aug 2014	 IdeaLab 2014: Program for Early Career Researchers: (* NSF-ICERM) Topic: "Toward a more realistic model of ciliated and flagellated organisms". Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, Providence, RI.
Jun 2012	Summer School on Recent Advances in the Theory of Homogenization. The University of Chicago, Chicago, $Il.(\clubsuit NSF)$
May 2011	Workshop on Macroscopic Modeling of Materials with Fine Structure. Center for Nonlinear Analysis, Carnegie Mellon University, Pittsburgh, PA.(& WPI)
Jan 2011	IPAM Workshop: Random Media: Homogenization and Beyond. Los Angeles, California.(4 IPAM)
Jan 2010	IPAM Workshop: Metamaterials: Applications, Analysis and Modeling. Los Angeles, California. (♣ IPAM)

Recent Organized Conferences/Minisimposia/Seminars

May 2016	SIAM Conference on Mathematical Aspects of Materials Science.Minisymposium: Mathematical and Computational Aspects of Nonlocal Models in Materials Science.Co-organizers: Yvonne Ou (UDel) and Bacim Alali (KSU).
Dec 2015	SIAM Conference on Analysis of Partial Differential Equations. Minisymposium: Multiscale Analysis, Modeling and Simulation for Applications in Materials Science. Co-organizer: Yuliya Gorb (UH)
Jan 2014	Joint Mathematics Meetings. AMS Special Session: Recent Advances in Homogenization and Model Reduction Methods for Multiscale Phenomena. Co-organizer: Burt Tilley (WPI)
Dec 2013	SIAM Conference on Analysis of Partial Differential Equations. Minisymposium: Homogenization and Multiscale Modeling of Heterogeneous Media. Co-organizer: Ana Vasilic (UAE University)
Jun 2013	SIAM Conference on Mathematical Aspects of Materials Science.Minisymposium: Multiscales Modeling, Microstructure, andLocal Field Properties of Heterogeneous Media.Co-organizers: Yuliya Gorb (UH) and Lyudmyla Barannyk (UIdaho)
Jan 2012	Joint Mathematics Meetings. AMS Special Session: Local Field Properties, Microstructure, and Multiscale Modeling of Heterogeneous Media. Co-organizer: Bogdan Vernescu (WPI)

Recent Invited Talks/Presentations

Dec 2, 2016	Cloaking: The Mathematics Behind Invisibility.
	Natural Sciences and Mathematics Colloquium Series, Colgate University.

Nov 17, 2015	Strong Approximations of Local Fields in Nonlinear Power Law Materials. Applied Math Seminar. Dept. of Mathematics, Syracuse University.
Apr 24, 2015	Cloaking: The Mathematics Behind Invisibility. Dept. of Mathematics, CompSci and Statistics, SUNY Oneonta.
Mar 26, 2015	Strong Approximations of Local Fields in Nonlinear Power Law Materials. Inverse Problems and Analysis Seminar. Dept. of Mathematical Sciences. University of Delaware.
Apr 3, 2013	Nonlinear Neutral Inclusions: Assemblages of Spheres and Ellipsoids. Dept. of Mathematics, Colgate University.
Feb 19, 2013	Nonlinear Neutral Inclusions: Assemblages of Spheres and Ellipsoids. Dept. of Mathematical Sciences, New Mexico State University.
Feb 5, 2013	Nonlinear Neutral Inclusions: Assemblages of Spheres and Ellipsoids. Mathematics Dept., Rose-Hulman Institute of Technology.
Jan 30, 2013	Nonlinear Neutral Inclusions. Dept. of Mathematics and Computer Science, California State University- East Bay.
Dec 5, 2012	Nonlinear Neutral Inclusions: Assemblages of Spheres and Ellipsoids. Dept. of Applied Mathematics, Wentworth Institute of Technology.
Oct 15, 2012	Nonlinear Neutral Inclusions: Assemblages of Spheres and Ellipsoids. Dept. of Mathematics and Computer Science, College of the Holy Cross.
Sep 21, 2012	Local Fields in Nonlinear Power Law Materials. School of Mathematical Sciences, Rochester Institute of Technology.
Apr 25, 2012	Nonlinear Neutral Inclusions: Assemblages of Spheres and Ellipsoids. Tufts University.
Mar 18, 2010	Correctors and Field Fluctuations for the $p_{\epsilon}(x)$ -Laplacian with Rough Exponents. PDE Seminar, Worcester Polytechnic Institute.

Presentations at Professional Meetings (& Travel support awarded)

- Dec 3, 2016 Nonlinear Neutral Inclusions: Assemblages of Spheres and Ellipsoids. Session: Nonlinear PDEs and Variational Problems. Canadian Mathematical Society Winter Meeting.
- May 11, 2016 Soret Effects in Electrokinetically-Driven Heat Exchangers for Electronics Applications. Session: Mathematical modeling of microstructured materials. SIAM Conference on Mathematical Aspects of Materials Science. Philadelphia, PA. (&-Research Council Grant Colgate)

Apr 11, 2015	Neutrality of Coated Ellipsoids with a Linear Shell and a Nonlinear Core. Session: Analytical and computational methods in nonlinear problems of solid mechanics.
	Campus. Rolla, Missouri. (&-Research Council Grant Colgate)
Mar 15, 2015	Navier Slip Condition for Viscous Fluids on a Rough Boundary. Fluid Transport Dynamics in Biology and Medicine, part of the Workshop Celebrating Diversity at the SIAM Conference on Computational Science and Engineering. Salt Lake City, Utah. (&-SIAM+Colgate)
Jul 8, 2014	Nonlinear Neutral Inclusions: Assemblages of Spheres and Ellipsoids. AWM - Workshop on Numerical and Theoretical Approaches for Nonlinear PDEs. SIAM Annual Meeting 2014. Chicago, II. (A-AWM)
Jan 17, 2014	Nonlinear Neutral Inclusions: Assemblages of Confocal Coated Ellipsoids. Joint Mathematics Meetings 2014. Baltimore, MD.
Dec 8, 2013	Nonlinear Neutral Inclusions: Assemblages of Confocal Coated Ellipsoids. Minisymposium on Homogenization and Multiscale Modeling of Heteroge- neous Media. SIAM Conference on Analysis of Partial Differential Equa- tions. Orlando, FL. (&-SIAM)
Nov 9, 2013	4th New York Conference on Applied Mathematics Cornell University. Ithaca, NY. (♣-NYCAM)
Jan 10, 2013	Nonlinear Neutral Inclusions: Assemblages of Spheres and Ellipsoids. AMS Special Session on Recent Advances and New Challenges in Applied Analysis. Joint Mathematics Meetings 2013. San Diego, CA.
Oct 13, 2012	3rd New York Conference on Applied Mathematics Rensselaer Polytechnic Institute. Troy, NY. (4 -NYCAM)
Jul 10, 2012	Correctors and Field Fluctuations for the $p_{\epsilon}(x)$ -Laplacian with Rough Exponents: The Sublinear Growth Case. Minisimposium: Homogenization and Model Reduction Methods for Multi-scale Phenomena. SIAM Annual Meeting. Minneapolis, MN. (\clubsuit -SIAM)
Mar 30, 2012	Nonlinear Neutral Inclusions Applied Math Days at RPI. Troy, NY. (&-NSF)
Jan 6, 2012	Nonlinear Neutral Inclusions: Assemblages of Disks and Ellipsoids. AMS Session: Partial Differential Equations, I Joint Mathematics Meetings 2012. Boston, MA.
Jul 13, 2010	Correctors and Field Fluctuations for the $p_{\epsilon}(x)$ -Laplacian with Rough Exponents. SIAM Student Chapter Presentations. SIAM Annual Meeting. Pittsburgh, Pennsylvania. (\clubsuit -SIAM)
May 26, 2010	Correctors and Field Fluctuations for the $p_{\epsilon}(x)$ -Laplacian with Rough Exponents. Session: Homogenization. SIAM Conference on Mathematical Aspects of Materials Science. Philadelphia, Pennsylvania.

Jan 14, 2010 Correctors and Field Fluctuations for the $p_{\epsilon}(x)$ -Laplacian with Rough Exponents. AMS session: Differential and difference equations, I. Joint Mathematics Meetings. San Francisco, CA.

Journal Referee

I have served as referee for the following journals

- Journal of Applied Physics (2)
- Proc. of the Royal Society A: Mathematical, Physical & Engineering Sciences (2)
- SIAM Journal on Applied Mathematics (2)
- SIAM Journal on Mathematical Analysis (2)
- Multiscale Modeling and Simulation (MMS) (2)
- Journal of Computational and Applied Mathematics (1)
- Applicable Analysis (1)

Service

F'15-S'16	Coordinator of the Colgate Math Department Seminar.
F'15-present	Coordinator of the MCM: The Mathematical Contest in Modeling.
F'15-present	Member of the NASC faculty liaison group.
F'16	Member of the Goldwater Committee.

Professional Affiliations

- American Mathematical Society (AMS)
- Society for Industrial and Applied Mathematics (SIAM)
- Society for Advancement of Chicanos and Native Americans in Science (SACNAS)
- Association for Women in Mathematics (AWM)

Computer Skills

Matlab, Maple.